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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/655,949	09/05/2003	Avi Tepman	4074C1/CPES/DT/PJS	8900

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Patent Counsel  
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EXAMINER
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MCDONALD, RODNEY GLENN

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 07/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/655,949

Applicant(s)

TEPMAN, AVI

Examiner

Rodney G. McDonald

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-20 is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☒ Claim(s) 2-11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION*****Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ferenbach et al. (U.S. Pat. 4,746,417) in view of Miller et al. (U.S. Pat. 5,171,415).

Ferenbach et al. teach in FIG. 2 it is shown that ***the target plate 4***, which already shows a decided consumption of its material, is fastened on ***a cathode base body 9*** (for example by soldering or bonding), which consists of a discoidal copper pan. The cathode base body 9 is fastened to a support plate 10, which in turn is joined through insulators, not shown, to the vacuum chamber, which also is not shown. Between the cathode base body 9 and the support plate 10 ***a shallow cylindrical cavity 11 is formed in which the yoke plate 1 is disposed rotatably and concentrically with the permanent magnets (dark areas)***, which are not further designated herein. ***For the purpose of the rotation of the yoke plate 1, it is fastened to the hollow shaft 3 which is supported on the support plate 10 by a rotatable bearing 12.*** The hollow shaft 3 serves for the introduction and removal of cooling water, the cooling water lines being omitted for the sake of simplicity. The hollow shaft 3 is rotated through a sprocket 13 and a cogbelt 14. (Column 4 lines 21-39)

The differences between Ferenbach et al. and the present claims is that an outlet port in cooling chamber for the removal of cooling water is not discussed, a stationary conduit is not discussed, and a rotary union for coupling to the stationary conduit to the rotating drive shaft is not discussed.

Miller et al. teach in Fig. 1 that a water chamber cover 41 has a water outlet opening 42 which provides the outlet for the cooling liquid 40, which is directed by the magnetic housing 110 onto the target backing plate 20 to cool the target backing plate 20 during sputtering. (Column 7 lines 10-14)

Miller et al. teach a stationary conduit, feed tubing 66, for providing cooling water. (See Fig. 1; Column 7 lines 47-50)

Miller et al. teach **a rotating support/seal block 60** having a hole 65 through its central axis, which is also the vertical central axis 35 of the water chamber 30 and the target backing plate 20. **This central axis of the rotating support/seal block 60 is designed to support and seal the rotating drive shaft 140. The support/seal block 60 acts as a rotating coupling, which is part of the internal passage of cooling liquid 40 being routed into the water chamber 30.** The rotating support/seal block 60 has an inlet opening 63 providing a threaded opening to connect feed tubing 66 to the central hole 65 in the rotating support/seal block 60. **The drive shaft 140 is provided through the rotating support/seal block 60. The drive shaft 140 is hollow from one end to the other.** A welded plug 142 is welded inside the top end 143 of drive shaft 140, closing the shaft opening to the top and an end block 144 is provided on the shaft 140 at its bottom end 145. The drive shaft end block 144 supports a portion of the

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rotating mechanism and provides a fluid outlet opening from the drive shaft's hollow central fluid passage. (Column 7 lines 39-59)

The hole 65 in the center of the rotating support/seal block 60 consists of several sections: two bearing sections 67a and 67b, two sealing sections 68a and 68b, and a water section 69. (Column 7 lines 60-63)

The two end bearing sections 67a, 67b hold respective bearing races 71a and 71b such that respective roller bearings 70a and 70b mounted on the drive shaft 140 roll in these races 71a, 71b and provide the rotating support between the stationary rotating support/seal block 60 and the rotating drive shaft 140. The roller bearings 70a, 70b are held in contact with their respective races 71a, 71b by, respectively, spacers 220 and collars 225 with spring washer 230, only one set (several of which might be installed) being shown in FIG. 1, or other suitable means which connect to the drive shaft 140. These collars and spring washers locate the bearings 70a, 70b on the drive shaft 140 and hold the drive shaft 140 in a predetermined relationship with the rotating support/seal block 60. (Column 7 lines 64-68; Column 8 lines 1-10)

The motivation for providing an outlet port in a cooling chamber is that it allows for the removal of cooling water. (Column 7 lines 10-14)

The motivation for providing a stationary conduit is that it allows for feeding water to the rotating shaft. (Column 7 lines 47-49)

The motivation for providing a rotary union for coupling the stationary conduit to the rotating drive shaft is that it allows for providing a support and seal means for the stationary conduit and rotating drive shaft. (Column 7 line 39)

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Ferenbach et al. by utilizing an outlet port in cooling chamber for the removal of cooling water, utilizing a stationary conduit, and a rotary union for coupling to the stationary conduit to the rotating drive shaft as taught by Miller et al. because it allows for removal of cooling water from the cooling chamber, allows for feeding water to the rotating drive shaft and allows for supporting and sealing the rotating shaft connected to the stationary cooling water feed conduit.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 and 19-27 of U.S. Patent No. 6,641,701 in view of Miller (U.S. Pat. 5,171,415).

U.S. Pat. No. 6,641,701 teach a target assembly, a cooling cavity having an outlet, a magnetron in the cooling cavity, a stationary conduit and a hollow rotating drive shaft for providing cooling fluid to a cooling chamber. U.S. Pat. No. 6,641,701 further

teach a stationary housing sealably coupling the stationary conduit to the hollow drive shaft. (See Claims 1-16, 19-27)

The difference between U.S. Pat. No. 6,641,701 and the present claims is that the rotary union is not discussed.

(It should be noted that the rotary union is stationary and has rotational means for the hollow drive shaft as part of it's construction)

Miller teach as discussed above a rotating support/seal block which is stationarily connected to the cooling cavity and utilizing bearings for rotation of the hollow drive shaft. (See Miller et al. discussed above)

The motivation for utilizing a rotary union is that it allows for joining a stationary conduit with a rotating shaft with proper sealing. (See Miller et al. discussed above)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified U.S. Pat. 6,641,701 by utilizing a rotary union as taught by Miller et al. because it allows for proper sealing between a stationary conduit and hollow rotating drive shaft.

#### ***Allowable Subject Matter***

Claims 2-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 12-20 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 2-8 are indicated as being allowable over the prior art of record because the prior art of record does not teach the claimed subject matter in conjunction with a seal interfacing with the hollow drive shaft proximate the second end.

Claims 9-11 are indicated as being allowable over the prior art of record because the prior art of record does not teach the claimed subject in conjunction with a bearing assembly engaged with the hollow drive shaft; and a seal for isolating the bearing assembly from the cooling cavity.

Claims 12-15 are indicated as being allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a bearing assembly engaged with the hollow drive shaft; and a seal for isolating the bearing assembly from the cooling cavity.

Claims 16-20 are indicated as being allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a bearing assembly engaged with the hollow drive shaft to facilitate rotation of the shaft relative the mounting flange; and a seal disposed between the hollow drive shaft and the flange.



Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rodney G. McDonald  
Primary Examiner  
Art Unit 1753

RM  
July 13, 2004